

CLAIMS:

*Sub D1*  
5 1. A cleaning system for cleaning boxes used for moving and storing semiconductor wafers, comprising:

an enclosure;

a rotor rotatably supported within the enclosure, with the rotor having box positions for holding a box;

10 a plurality of spray manifolds positioned to spray a cleaning or rinsing fluid towards the rotor, with at least one of the spray manifolds having a plurality of straight spray nozzles, and also having at least one angle spray nozzle.

15 2. The cleaning system of claim 1 where the straight spray nozzles spray in a pattern having a horizontal central axis, and the angle spray nozzle sprays in a pattern having a central axis extending upwardly or downwardly at an angle relative to the horizontal central axis.

*Sub D1*  
20 3. The cleaning system of claim 2 where the angle is from 30-60 degrees.

4. The cleaning system of claim 1 where the angle spray nozzle is oriented to spray in a pattern having a central axis directed opposite to the direction of rotation of the rotor.

5. The cleaning system of claim 1 wherein the manifold has two angle nozzles separated by at least two straight spray nozzles.

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*Sub B2* 6. A method for cleaning five sided boxes of the type used for carrying and storing semiconductor wafers, comprising the steps of:

10 placing the boxes in or on a rotor with the open side of the box facing radially outwardly and away from the center of the rotor;

spinning the rotor holding the boxes;

15 spraying a first spray of a cleaning liquid towards the center or spin axis of the rotor; and

spraying a second spray of the cleaning liquid at an angle relative to the first spray.

*Sub A* 7. The method of claim 6 where the first spray is sprayed in a pattern having a centerline or center axis which is generally horizontal, and where the second spray is also sprayed in a pattern having a centerline which is generally horizontal.

8. The method of claim 6 where the first spray is oriented horizontally and the second spray is oriented upwardly or downwardly at an angle relative to the first spray.

C 5 3. The method of claim 1 where the center axis of the first spray is aimed at the center of the rotor, and the centerline of the second spray is aimed at an angle to the first spray, so that the second spray sprays a pattern of liquid in a direction towards or opposite to the spin direction of the rotor.

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